



Application No. 10/072,605

Amendments to the Claims:

1. (previously presented) An apparatus comprising:
a material source means for supplying a material to be deposited;
an atomization means for producing a plurality of discrete particles from said material source means;
a force application means for propelling said plurality of discrete particles generally toward a substrate; and
a collimation means for controlling the direction of flight of said plurality of discrete particles.

2. (currently amended) The apparatus of claim 1 additionally comprising means for sorting said plurality of discrete particles by size ~~from smaller particles~~.

3-6. (canceled)

7. (previously presented) The apparatus of claim 1 wherein said force application means comprises a carrier gas.

8. (previously presented) The apparatus of claim 7 wherein said force application means additionally comprises a laser.

9. (currently amended) The apparatus of claim ~~[[1]]~~ 7 wherein said collimation means comprises ~~means for entraining said plurality of particles in a sheath gas~~ a coflowing sheath gas which surrounds said carrier gas.

10. (currently amended) The apparatus of claim 9 wherein said ~~entraining means~~
~~comprises means for annularly surrounding said plurality of particles at an orifice of said collimation~~
~~means~~ coflowing sheath gas forms a boundary layer that prevents said plurality of discrete particles from
depositing onto walls of an orifice nozzle.

11. (previously presented) A method of direct writing of a material, the method comprising
the steps of:

supplying the material to be deposited;

atomizing the material to produce a plurality of discrete particles;

applying a force to propel the plurality of discrete particles generally toward a
substrate;

collimating the plurality of discrete particles to control the direction of flight of the
plurality of discrete particles; and

depositing the plurality of discrete particles on the substrate.

12. (currently amended) The method of claim 11 additionally comprising the step of sorting the
plurality of discrete particles by size ~~from smaller particles.~~

13. (currently amended) The method of claim 12 wherein the sorting ~~and collimating steps~~
step comprises ~~comprise~~ employing one or more virtual impactors.

14-16. (canceled)

17. (previously presented) The method of claim 11 wherein the applying step comprises
employing a carrier gas.

18. (previously presented) The method of claim 17 wherein the applying step additionally comprises employing a laser.

19. (currently amended) The method of claim 44 17 wherein the collimating step comprises ~~entraining the plurality of particles in a~~ surrounding the carrier gas with a coflowing sheath gas.

20. (currently amended) The method of claim 19 ~~wherein the entraining step comprises~~ annularly surrounding the plurality of particles at an orifice employed in the collimating step further comprising the step of the coflowing sheath gas forming a boundary layer, thereby preventing the plurality of discrete particles from depositing onto walls of an orifice nozzle.

21. (new) The apparatus of claim 1 further comprising a virtual compactor.

22. (new) The apparatus of claim 21 wherein said virtual compactor is placed after said atomization means.

23. (new) The apparatus of claim 22 wherein said virtual impactor extracts excess carrier gas without substantially reducing the number of said discrete particles.

24. (new) The apparatus of claim 22 wherein said virtual impactor sorts said plurality of discrete particles by size.

25. (new) The apparatus of claim 22 further comprising two or more virtual impactors placed in series.

26. (new) The apparatus of claim 1 further comprising a laser for processing said discrete particles.
27. (new) The method of claim 11 further comprising the step of extracting excess carrier gas without substantially reducing the number of said discrete particles.
28. (new) The method of claim 28 wherein the extracting step comprises employing a virtual impactor.
29. (new) The method of claim 11 further comprising the step of placing two or more virtual impactors in series.
30. (new) The method of claim 11 further comprising the step of processing the discrete particles with a laser.